Inter-university Upper atmosphere Global Observation NETwork (IUGONET)

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IUGONET

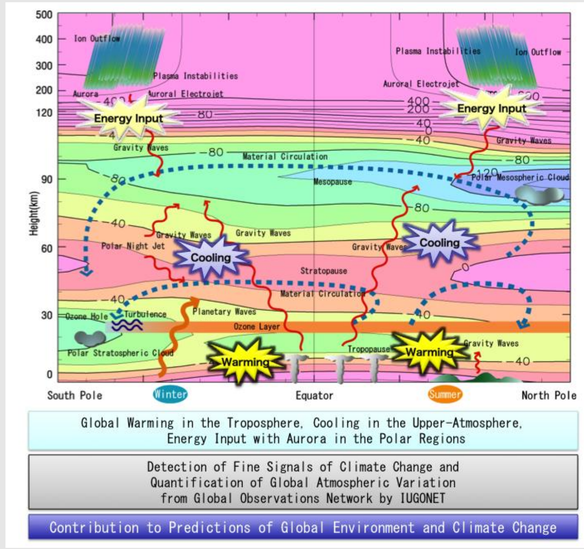
Inter-university Upper atmosphere Global Observation NETwork

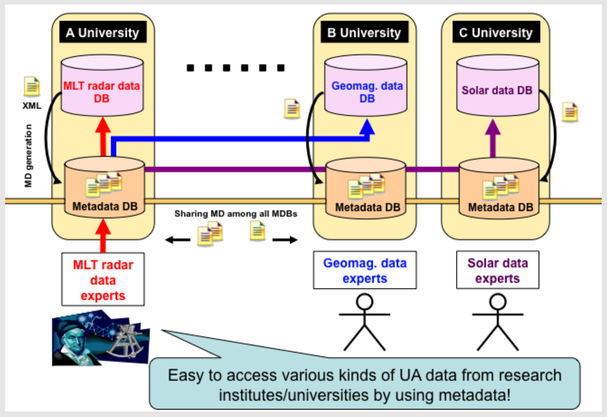
Metadata DB for Upper Atmosphere

Web address: http://www.iugonet.org/en

The IUGONET project - objectives

- **Because exchanges of materials, momenta, and energies in the upper atmosphere take place through complicated physical processes at different layers, integrated analysis by using various kinds of observational data is essential for investigating the mechanism of long-term variations in the upper atmosphere.**
- **However, the databases of such observations have been managed and maintained by each institution that conducted the observations. There is no way to cross-search these database.**
- **The purpose of this project is to develop a metadata database (MDB) of the upper atmospheric data by ground-based observations accumulated since IGY by Japanese research institutes, and then to promote effective use of the observational data spread across the institutes, which will lead to interdisciplinary, comprehensive studies of the upper atmosphere.**

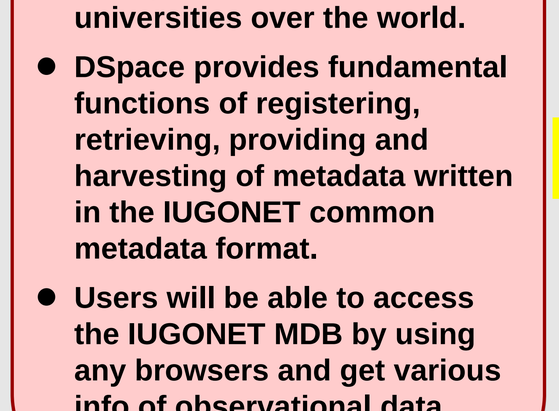




Design of metadata format

IUGONET common metadata format = SPASE + modifications

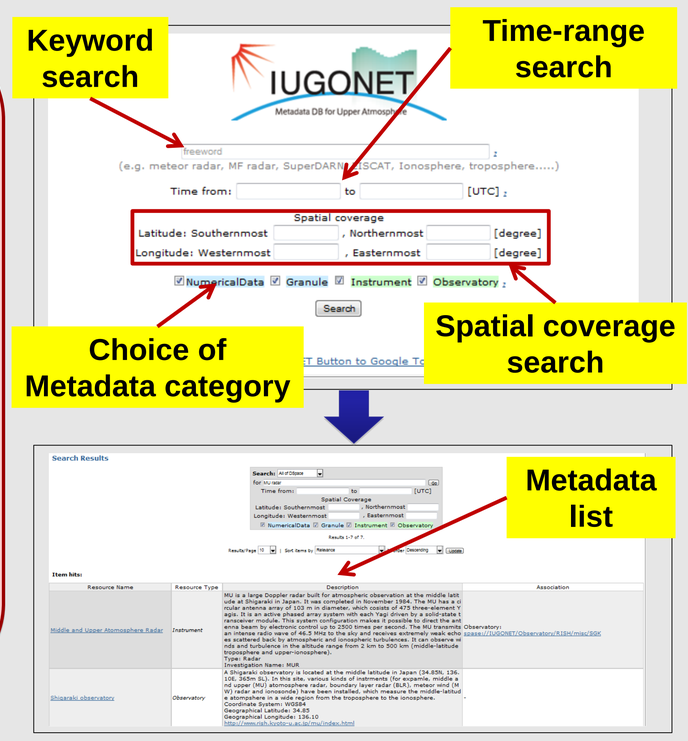
(http://www.spase-group.org)



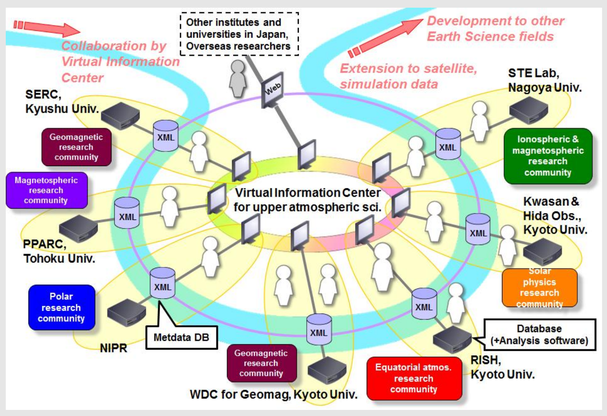
- **We investigated widely-used metadata formats in various scientific fields in the course of the development of the IUGONET metadata format.**
- **Among them we selected the SPASE data model/metadata format as the base of the IUGONET metadata format since it matches best the upper atmospheric data and holds expandability to fit any kinds of observational data.**
- **A few modifications according to characteristics of our observational data have been added.**

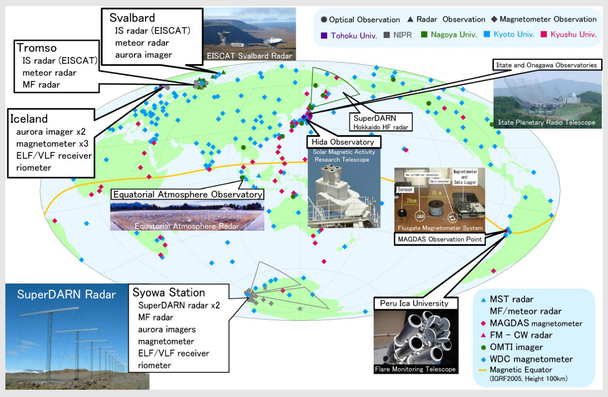
Development of MDB system

- **The IUGONET MDB system is being built on the platform of DSpace, which is widely used by digital repositories in many universities over the world.**
- **DSpace provides fundamental functions of registering, retrieving, providing and harvesting of metadata written in the IUGONET common metadata format.**
- **Users will be able to access the IUGONET MDB by using any browsers and get various info of observational data through the metadata.**



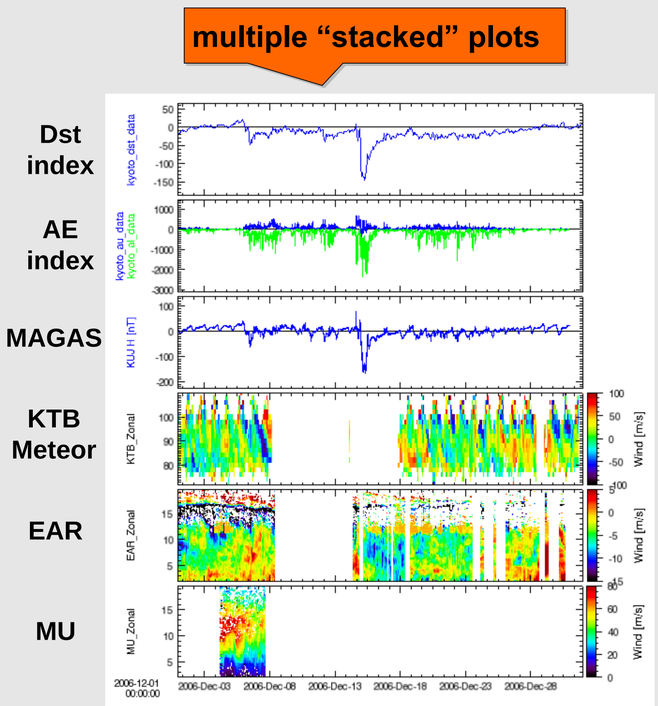
Inter-university collaboration

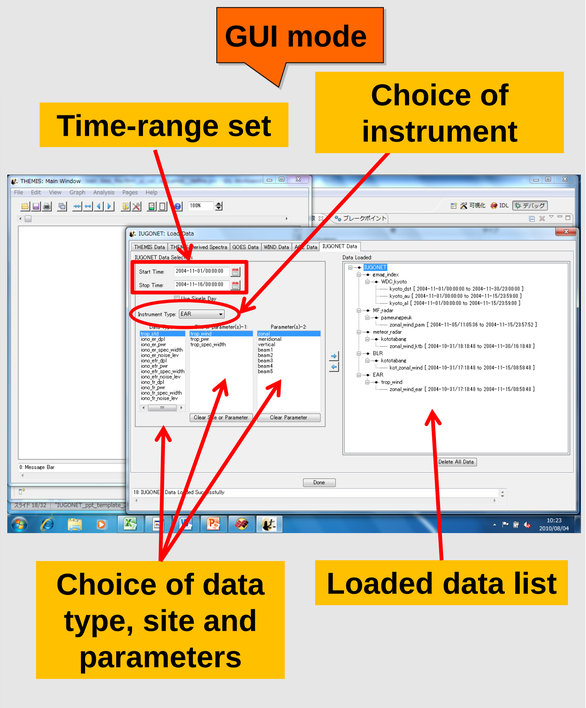




- **A six-year research project, Inter-university Upper atmosphere Global Observation NETwork (IUGONET), was initiated in 2009 by the five Japanese universities/ institutes (NiPR, Tohoku Univ., Nagoya Univ., Kyoto Univ., and Kyushu Univ.) that have been leading ground-based observations of the upper atmosphere for decades.**
- **The MDB will be of great help to researchers in efficiently finding and obtaining various kind of observational data we have obtained for many years by the global network of radars, magnetometers, optical sensors, helioscopes, and so on.**

Development of analysis software





- **The IUGONET is developing an integrated data analysis tool based on TDAS (THEMIS Data Analysis Software Suite) composed of IDL routines. The software will have capability to get, visualize and analyze data distributed from the institutions in our project.**
- **The data analysis software will provide both the GUI (Graphical User Interface) and the CUI (Character User Interface), in order to enable even beginners to utilize its functions. Any user will be able to use the GUI-based software developed by IUGONET on the free IDL Virtual Machine.**
- **Our software development is conducted in collaboration with the ERG Science Center.**

Project timeline

Task	Y2009	Y2010	Y2011	Y2012	Y2013	Y2014	Detail
Virtual information center (VIC) of UA studies	System installation	Normal operation		System update			Construct the integrated research environment (TV-conference system, ..)
Development of metadata DB system	Prototype system devel.	Regular system devel.	Open to public				Design and develop the metadata DB system
Design the Metadata format standards	Ver.1 format	Update & document					Release the format ver.1 and keep updating if necessary
Development of data analysis software	Specifications and basic design	Programming	Open to public				Develop and release analysis softwares for UA data
Maintenance&extension of existing DBs of Observation data		Maintenance of obs. DBs & exam. of non-digital dataset		Effort focused on old data from Y2012 on			Incorporate non-DB'd data into the DBs
Metadata generation		Collecting metdata from each obs. DB		Effort focused on old data from Y2012 on			Generate metadata in the designated format and add to metadata DB
Operation of metadata DB							Release the metadata DB for community
VIC extension to related fields							Wrap up the project and discuss further extension

- **Through frequent discussions on the virtual information center, the IUGONET metadata format has been designed, and our metadata DB system and integrated data analysis software are now in process of being developed .**

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